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TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

Ce rapport est aussi disponible en français

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE FOUNDERING OF THE SMALL CANADIAN F/V "PACIFIC IMMORTAL" OFF TRIPLE ISLANDS, B.C., MARCH 25, 1988

REPORT No. 521

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE FOUNDERING OF THE SMALL CANADIAN FISHING VESSEL "PACIFIC IMMORTAL" OFF TRIPLE ISLANDS, B.C., MARCH 25, 1988.

Particulars of Vessel

Name	"PACIFIC IMMORTAL"
Official Number	345988
Port of Registry	Victoria, B.C.
Gross Tonnage Net Tonnage	48 32
Length	17.07 m
Breadth	4.91 m
Depth	2.16 m
Draught (at time of incident)	1.50 m Fwd 1.82 m Aft
Built	1972, Victoria, B.C.
Type	Steel trawler/packer
Cargo	30 tons cod
Crew	3
Propulsion	One Caterpillar, diesel D3408, 365 BHP single fixed-pitch propeller
Owner	Seven Seas Fishing Co.Ltd., Ladner, B.C.
Operator	Clayton Odberg, White Rock, B.C.

Navigation Equipment

Radar	(1)	Furuno 48 mi.
Loran-C	(1)	Sitex 797
Echo Sounder	(1)	Sitex 720 color video sounder

Radiotelephone	(1)	Spilsbury, 6 Channel SSB
	(1)	ICOM M80 VHF
Compass	(1)	Wagner, 8 in.
Auto-pilot	(1)	Wagner, MK4
Steering		Wagner, hydraulic

Life-saving Equipment

Lifeboat	(1)	3.66 m (12') aluminum
Liferaft	(1)	Dunlop, 4 man Seafarer 'A' pack
Lifebuoys	(2)	(1) with line (1) with light
Lifejackets	(4)	D.O.T. approved Keyhole, adult
Immersion Suits	(4)	FitzWright
Distress rockets		Standard flare kit

Vessel Description

The "PACIFIC IMMORTAL" was a small Canadian stern trawler, of welded steel construction; her wheel-house was situated forward of amidships, fish hold abaft the wheel-house and general work area aft.

She carried cargo in three insulated fibreglassed fish tanks served by a chilled brine (champagne) system. Her hull was divided by three transverse watertight bulkheads: one separated the crew accommodation and engine-room, one the engine-room and fish hold, and a third separated the fish hold and lazaret.

Accommodations were standard with the master's stateroom, galley, head and shower on the main deck. Access to the crew accommodation forward was down a ladder situated in the forward port side of the cabin.

The vessel was equipped with hydraulically-powered twin winches and net drums.

Being a fishing vessel over 15 gross tons the "PACIFIC IMMORTAL" was subject to quadrennial inspection by the Ship Safety Branch of the Canadian Coast Guard. Following major bow repair at New Westminster, B.C. in November 1986 as a result of a collision in October, 1986, she was last inspected in December

1986 and issued an inspection certificate (SIC 29) at New Westminster, B.C. due to expire in July 1990. She was certificated for home trade class II voyages and could carry a complement of three.

Note: 1. All times are expressed in Pacific Standard Time (UTC minus 8 hours)

2. A glossary of abbreviations and terms can be found following Findings in this report.

Background

The fishing vessel "PACIFIC IMMORTAL" departed Tow Hill, Graham Island, B.C. at approximately 0530, March 25, 1988, in a partially loaded condition, with a crew of three en route to Port Edward, B.C. to discharge her cargo of approximately 30 tons of black cod.

Weather conditions were described as poor, with south-easterly winds 15 knots, 1 to 2 metre seas, and good visibility when the vessel departed port.

The vessel was shipping heavy seas on her afterdeck and water was accumulating faster than it could run off when, at 1245 the vessel rolled to starboard and did not recover. Successive seas caused the vessel to lay on her starboard beam ends, down-flood and sink.

The three crewmembers abandoned ship at 1255 in their inflatable liferaft and drifted until 1403, when they were rescued by the Canadian Coast Guard fast response boat (FRB) "POINT HENRY 2", transferred to the fishing vessel "FREEPORT" and later taken aboard the Canadian Coast Guard Cutter (CCGC) "POINT HENRY" for Prince Rupert, B.C. where they arrived at 1610.

There were no injuries as a result of this incident; pollution was minor and consisted of diesel fuel subsequently dissipated by wind and waves.

The vessel is a total loss with an estimated replacement cost of $800,000.

This was the fifth vessel engaged in the black cod industry on the West Coast to experience a serious casualty during the last 2 years.

Narrative

The "PACIFIC IMMORTAL" departed Tow Hill, Graham Island, B.C. on March 25, 1988 at approximately 0530, with a crew of three including the skipper. Her destination was Port Edward, B.C. to discharge a cargo of approximately 30 tons of black cod that had been collected from the fishing vessel "JEANNA MARIE".

The skipper had control at the helm, navigating the vessel by radar distances off known landmarks and local knowledge. At 1100, a deck-hand, feeling uneasy about the vessel's motion, donned his immersion suit and sat at the galley table. The skipper and cook/deck-hand retrieved their suits and kept them close at hand. The skipper reduced engine speed and went below to check for any flood water but none was found.

At 1230, the cook/deck-hand, standing at the galley entrance, observed that more water was accumulating on the afterdeck than earlier in the morning. He advised the skipper, who further reduced speed to about 2 knots and went below to check for water: the bilges were still dry. The lazaret was not checked, neither were any of the pumps put into operation.

At approximately 1245, the vessel rolled to starboard and did not recover. Water was shipped on the already flooded after-deck, her starboard bulwark went under, and the vessel lay on her starboard beam ends. The skipper ordered the deck-hand to send a 'Mayday' while he and the cook/deck-hand donned their immersion suits. The aluminum hatch cover was displaced and seawater began to downflood into the fish hold and to enter the cabin through the open door.

The 'Mayday' was transmitted on channel 8 VHF, the frequency in use at the time, and an immediate response was received from the fishing vessel "OUR OWN" advising she was underway to render assistance.

At 1255, after considerable effort due to the list, the skipper and the cook/deck-hand launched their inflatable life-raft. When the skipper began to haul on the painter to inflate the raft, the painter became fouled inside the canister. After about 5 minutes the skipper managed to free the painter and the raft inflated without further incident; the crew then abandoned ship.

At 1300 the "PACIFIC IMMORTAL", still laying on her star-board side, downflooded into the engine-room and crew accomm-odation by way of unsecured access openings, and sank in approx-imate position 54°17'N, 130°55'W, in about 60 metres of water.

At 1300 the fishing vessel "FREEPORT" advised Prince Rupert

Coast Guard Radio Station (CGRS), on channel 16 VHF that she had overheard a 'Mayday' call from the "PACIFIC IMMORTAL" sinking approximately 3 miles west or south-west of Triple Islands and that she was proceeding to search for survivors.

At 1304, Prince Rupert CGRS broadcast a 'Mayday' relay. The Fisheries patrol vessel "CUTTER ROCK" reported at 1305 that she was proceeding to the assistance of the distressed vessel.

Rescue Co-ordination Centre (RCC) Victoria tasked the Canadian Coast Guard Cutter (CCGC) "POINT HENRY" at 1306 and at 1312, the CCGC "POINT HENRY" and the fast response boat (FRB) "POINT HENRY 2" departed Fairview, Prince Rupert.

At 1316, the fishing vessel "OUR OWN" reported having heard the 'Mayday' broadcast from the "PACIFIC IMMORTAL" and that she was proceeding to assist.

Prince Rupert CGRS made another 'Mayday relay' broadcast at 1321.

At 1357, the Coast Guard helicopter CG '358' that had been tasked by RCC Victoria to assist in the search for the vessel, reported seeing an oil slick and three people in a rubber raft.

At 1400, the United States Coast Guard helicopter 'CG 1495' was tasked by RCC, Victoria to assist in the search.

At 1403, the FRB "POINT HENRY 2" arrived on scene and at 1405 advised Prince Rupert CGRS that they had the three survivors on board and they would be transferred to the fishing vessel "FREEPORT".

RCC, Victoria, stood down the USCG helicopter CG '1495' at 1407 and the assisting fishing vessels. Prince Rupert CGRS broadcast cancellation of the 'Mayday' at 1408.

The survivors were later transferred to the CCGC "POINT HENRY" and transported to Prince Rupert, arriving at 1610.

Analysis

1. Navigation Appliances and Machinery

The navigation appliances and steering gear on the "PACIFIC IMMORTAL" were reportedly in good operating condition during her trip from Tow Hill, Graham island, B.C., to Port Edward. No equipment malfunctions occurred that might have contributed to the capsizing and sinking.

2. Bilge /Fire Pumps

The vessel was equipped with the following bilge/fire pumps:

Bilge Pump	One, deck-mounted, manually operated: fish hold only.
Chilled Brine Circulating/Fire pump	455 lpm (100 gpm) 38.1 mm (1.5") dia.bilge line; hydraulically powered by a diesel auxiliary motor capable of drawing from all compartments, including the lazaret.
Bilge/Fire Pump	91 lpm (20 gpm) 38.1 mm (1.5") bilge line, hydraulically powered from belt driven power take-off on main engine.

The pumps were not used.

3. Survival/Distress Equipment

The vessel complied with the Small Fishing Vessel Inspection Regulations with equipment used as follows:

Lifejackets	Not worn; crew wore their immersion suits.
Liferaft	Dunlop, 4 person with 'A' pack; used by crewmembers to abandon ship; five minute delay inflating and launching due to fouled painter inside canister; liferaft was last inspected in September 1986 at Richmond, B.C.; at the time of the casualty the liferaft was 7 months overdue for inspection.
Lifeboat	3.66 m (12') aluminum boat; not used, sank with vessel.
EPIRB	Not required by Regulations and none carried.
Immersion Suits	Not required by Regulations however crew wore their own FitzWright suits.
Radiotelephone	The deck-hand transmitted a

'Mayday' on channel 8, VHF and not on the distress frequency channel 16. The F/V "OUR OWN" responded immediately.

4. VHF Radiotelephone Regulations

The "PACIFIC IMMORTAL", being a Canadian vessel less than 20 metres in length, was not required, pursuant to the Ship Station Radio Regulations, to be fitted with a VHF installation. The vessel was voluntarily fitted with a VHF unit and licensed by the Minister of Communications pursuant to the Radio Act.

Under the General Radio Regulations, Part II, the operator of such a VHF installation is required to be in possession of a Radiotelephone Operator's Restricted Certificate, (RORC), Maritime. The skipper of the "PACIFIC IMMORTAL" possesses the requisite certificate.

5. Weather Conditions

The marine forecast issued by the Pacific weather centre of Environment Canada at 1045 PST, Friday, March 25, 1988 for the period ending 1100 PST Saturday, March 26, with an outlook for the following 24 hours follows:

> HECATE STRAIT
> Gale warning continued
>
> Winds south to south-west 20-30 knots rising to south-westerly 30 to gales 40 this afternoon then easing to west to south-west 20-30 over-night. Showers. Outlook becoming strong south-westerlies.
>
> DIXON ENTRANCE
> Gale warning continued
>
> Winds southerly 25 to gales 35 knots shifting to westerly 20 to 30 tonight and diminishing to 10-25 Saturday morning. Showers. Outlook, moderate to strong north-westerly winds.

The weather conditions recorded at Triple Islands at 1240, March 25, were reported as: cloudy, visibility 15 miles, winds south-west at 20, sea 1.22 m (4 ft), moderate swell and barometer steady.

Weather experienced by the "PACIFIC IMMORTAL" three miles south-west of Triple Island was reported as: cloudy, visibility 10 miles, winds south-east at 15-20, sea 1.8 m -3.0 m

(6-10 ft).

Tides and Currents

Tidal predictions in Chatham Sound are given for Prince Rupert (Index No.9354), in the Canadian Tide and Current Tables, Vol.6.

On March 25, 1988, high water at Prince Rupert was predicted to occur at 0630 with a height of 5.2 metres (17.2 ft) above chart datum; low water was predicted to occur at 1340 with a height of 2.2 m (7.3 ft) above chart datum.

In the south part of Chatham Sound flood tidal streams entering from Brown, Bell and Edye Passages, and the flood setting north from Malacca Passage, produce, for the most part, an easterly set of about 2 knots; the ebb tide has a reverse effect.

In the vicinity of Triple Islands the tidal streams are strong and irregular.

Tidal streams are greatly affected by prevailing winds.

Sea Conditions

At the time of the foundering the crew of the "PACIFIC IMMORTAL" reported sea conditions as:

Direction of Sea	South-east
Height	2 - 3 metres
State	Heavy and confused

Conditions, as recorded at Triple Islands and Green Island were:

Direction of Sea	South to south-west
Height	1 metre
State	Moderate

6. Cargo Stowage

The "PACIFIC IMMORTAL" carried her cargo in three insulated fibreglassed fish tanks which were served by a chilled brine (champagne) system. Each of the port and starboard fish tanks were approximately 1.98 m (6 ft) deep, 4.57 m (15 ft) long and 2.13 m (7 ft) wide. These were filled to about 80% capacity with seawater and about 10 tons of black cod in each tank.

The aft fish tank was approximately 4.27 m (14 ft) wide,

2.44 m (8 ft) long and 1.37 m (4.5 ft) deep. It carried approximately 10 tons of black cod and was reportedly, filled to deck level but not into the hatch coaming.

These tanks were not topped up prior to departure for Port Edward thereby contributing to the free-surface effect.

7. Fuel and Water Tanks

The location, number and capacity of the water and fuel tanks of the "PACIFIC IMMORTAL" at the time of the casualty, were as follows:

Location		Capacity (Diesel Fuel)	Contents
Engine-room Port aft	(1)	1136.5 ltrs. 250 gal.	909.2 ltrs. 200 gal.
Engine-room Starboard Aft	(1)	3182.2 ltrs. 700 gal.	2273.0 ltrs. 500 gal.
Lazaret Fuel Tank Starboard Quarter	(1)	3636.8 ltrs. 800 gal.	1818.4 ltrs 400 gal.
		Capacity (Water)	**Contents**
Lazaret Port Quarter	(1)	3636.8 ltrs. 800 gal.	1818.4 ltrs. 400 gal.

The contents of each tank as provided by the vessel's skipper are approximate.

8. Freeing Ports

The vessel was reportedly fitted with a total of four freeing ports, each measuring approximately 30.48 cm (12 in) x 30.48 cm (12 in). There were also 12 openings down each side of the vessel fitted with vertical steel bars which were approximately 10.16 cm (4 in) in height and 45.72 cm (18 in) in length.

It was reported that the "PACIFIC IMMORTAL" had a 7.62 mm (3 in) freeboard upon departing port. This, together with adverse weather and sea conditions contributed to the shipping of water on the afterdeck.

In general, few fishermen fully understand free-surface effect and fewer appreciate the substantial loss of transverse stability when water, even a few inches, is shipped and retained on deck. Coupled with the loss of effective

waterplane area when the deck edge is submerged, the effects can be disastrous.

9. Stability

As a small fishing vessel of more than 15 gross tons, not engaged in fishing for herring or capelin, the "PACIFIC IMMORTAL" was not required to comply with the stability requirements contained in Part I, Section 29, of the Small Fishing Vessel Inspection Regulations. Furthermore, since basic hull characteristics were not available, the transverse stability of the vessel at the time of her loss is not known nor could it be derived.

It would appear that the heavily laden "PACIFIC IMMORTAL", having shipped and retained water on the afterdeck, was in a highly vulnerable condition. The dynamic heeling effect produced by the impetus of the vessel's rolling motion in the prevailing sea state together with the free-surface effects of the shipped water and slack fish tanks, overcame her initial ability to recover. Having been rolled toward the limiting range of positive stability, the vessel, because of reduced righting levers, remained heeled to starboard for some time. When the bulwark became immersed, the sudden increase in rate and quantity of water shipped and retained on the main deck retarded the vessel's recovery. The increased angle of heel led to additional water being shipped and the subsequent downflooding, by way of unsecured access doors and fish holds hatch cover, into compartments below the main deck, prevented the vessel's return to the upright. This downflooding continued until all reserve buoyancy was lost and the vessel sank.

10. Publications

The 'Safe Boating Guide', the 'Manual of Safety and Health for Fishermen' and an 'Introduction to Fishing Vessel Stability', published by the Canadian Coast Guard, contain practical advice on navigation, stability, safety and equipment required on fishing vessels. In many instances, these suggestions have developed as a result of frequent past occurrences in the fishing industry.

In order to improve fishing safety, chapter 1, section 'General Provisions ' of the 'Manual of Safety and Health for Fishermen', defines the purpose and scope of the manual as:

> 1.1.1. The purpose of this publication is to provide information with a view to promoting the safety and health of fishermen.

1.1.2 It may also serve as a guide to those concerned with framing measures for the improvement of safety and health on board fishing vessels but is not a substitute for existing laws and regulations.

1.1.3 Its scope is limited to information necessary for safe working and fishing conditions on board.

The section on 'stability' in the Manual 'Safety and Health for Fishermen', is limited to the following:

3.5.1. Skippers and mates should understand the basic principles of stability.

3.5.3. The initial stability of a fishing vessel up to 70 metres in length can be approximately determined by the rolling period test. A suggested method for carrying out this test has been issued by IMO and can be explained by the local steamship inspector.

11. Access Hatches

The manholes that provided access to the lazaret and fish tanks were of aluminum alloy construction fitted with gaskets and a key-operated cross bar locking device.

The main cargo hatch cover was of aluminum alloy with three access hatches to the fibre-glassed fish tanks. These were not tarped or battened down before departing for Port Edward. It was standard practice to place the aluminum cover on the hatch; its own weight and design were thought sufficient to keep it in place.

It was reported that water may have entered the lazaret through a loose manhole cover (this could not be confirmed because of the accumulated water on the afterdeck).

12. Vessel Traffic Services

The "PACIFIC IMMORTAL" was not participating in the Prince Rupert Vessel Traffic Reporting System (VTS), neither was she required to as in addition to being a voluntary system, the provisions of Notices to Mariners No.25 (1986) do not apply to vessels less than 20 metres in length.

13. Certification and Experience of Crew

The skipper of the "PACIFIC IMMORTAL" does not hold a Certificate of Competency from the Department of Transport to operate the vessel, neither is he required to by Regulations. He commenced fishing as a youth, serving as a deck-hand, mate and skipper on different vessels. He has been a skipper for the past 6 years with the past 2 1/2 years as skipper of the "PACIFIC IMMORTAL".

The cook/deck-hand began fishing in 1975. He was the owner of a troller for four years and joined the "PACIFIC IMMORTAL" in March 1987. He is a certificated Diver and in 1973 he completed a 20 hour navigation course at Camosun College, Victoria, B.C.

The other deck-hand is reportedly an experienced fisherman who joined the "PACIFIC IMMORTAL" in February, 1988.

Findings

In the afternoon of March 25, 1988, the Canadian fishing vessel "PACIFIC IMMORTAL" capsized, downflooded and foundered in poor weather conditions off Triple Island, B.C.

The precise cause of the casualty cannot be determined however it is felt that the following factors may have contributed to the loss of the vessel:

- low freeboard on departure;
- the fish hold hatch cover which could not be battened down;
- the possibility of water ingress into the lazaret;
- the transverse stability was reduced due to the free surface effects of the fish tanks not being topped up into hatchway coamings, the partially filled fuel and water tanks and the accumulated seawater on deck, and
- the vessel proceeded to sea in adverse weather conditions despite a gale warning.

Other Findings

The 'Mayday' was transmitted on channel 8, VHF, not on the designated calling/distress frequency channel 16.

The liferaft used to abandon ship was seven months past its annual inspection date.

Marine Casualty Investigations
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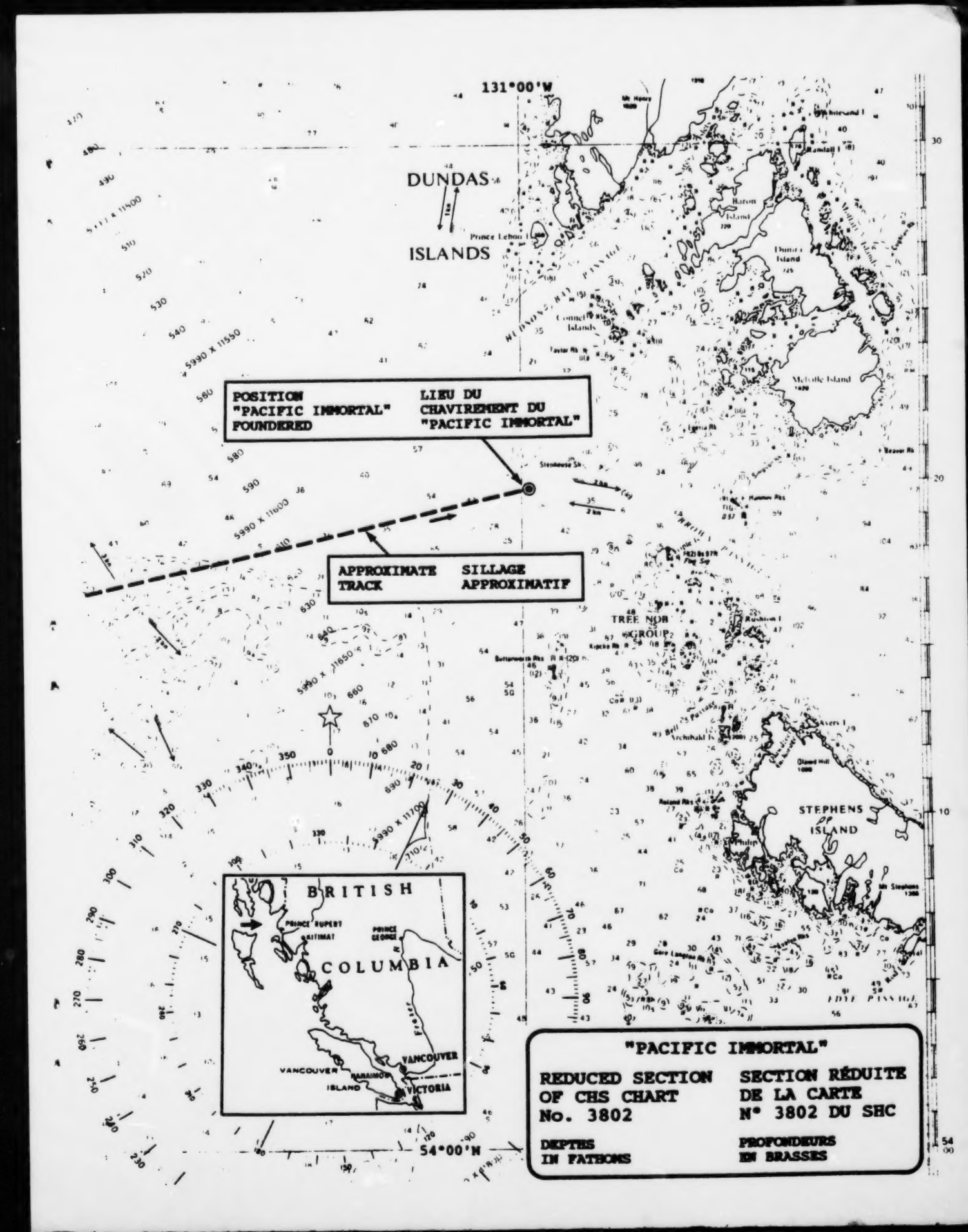
MAY 1989

GLOSSARY

Automatic Pilot	Course keeping by mechanical means
BHP	Brake Horsepower
Chart Datum	Based on lowest water predictable
Ebb	Falling tide
EPIRB	Emergency Position-indicating Radio Beacon
Flood	Inflow of the tide
Free Surface Effect	Whenever there is a surface of liquid which is free to move there is a loss of effective 'GM' due to a virtual rise of the vessel's centre of gravity.
Lazaret	The enclosed space at the stern of a vessel often housing the steering gear.
'Mayday'	International radio distress signal used when calling for assistance.
Stability	Ability of a vessel to right herself when inclined from the upright.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DUNDAS
ISLANDS
POSITION
"PACIFIC IMMORTAL"
FOUNDERED
LIEU DU
CHAVIREMENT DU
"PACIFIC IMMORTAL"
APPROXIMATE
TRACK
SILLAGE
APPROXIMATIF
TREE NOB
GROUP
STEPHENS
ISLAND
BRITISH
COLUMBIA
PRINCE RUPERT
PRINCE
GEORGE
VANCOUVER
VANCOUVER
ISLAND
VICTORIA
54°00'N
"PACIFIC IMMORTAL"
REDUCED SECTION
OF CHS CHART
No. 3802
SECTION RÉDUITE
DE LA CARTE
N° 3802 DU SHC
DEPTHS
IN FATHOMS
PROFONDEURS
EN BRASSES